

Contribution of a Metal-Peroxide Adduct to Neurodegeneration Is Due to Its Oxidative Protease Activity

Yuzo Nishida* and Satoshi Nishino

Institute for Molecular Science, Okazaki 444-8585, Japan.

Fax: +81-564-55-5245. E-mail: yuzo@ims.ac.jp

* Author for correspondence and reprints requests

Z. Naturforsch. **54c**, 1107-1114 (1999); received July 4, 1999

Metal-peroxide Adduct, Neurodegenerative Diseases, Oxidative Protease Function, Cleavage of Protein

Many hypotheses have been developed to explain aging and age-related neurodegenerative disorders; one of the most compelling is the role of oxidative stress to induce changes in protease activity in brains of patients of Alzheimer's disease and prion disease. At the moment however, there is no clear answer how protein degradation may be achieved in the brain. We have observed that several metal compounds can degrade proteins in the presence of hydrogen peroxide, and elucidated the reaction scheme based on the new theoretical point for the reactivity of a metal-peroxide adduct with η^1 -coordination mode. In this article we would like to point out the importance of a copper(II)-peroxide adduct to promote neurodegenerative diseases such as prion disease and amyotrophic lateral sclerosis through its oxidative protease function.